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The oral health of individuals with dental phobia: a multivariate analysis of the Adult Dental Health Survey, 2009.

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Abstract

Background: Adults with dental phobia have been reported to have poorer oral health and oral health related quality of life. The aim of this study is to explore the social and demographic correlates of oral health and oral health related quality of life (OH-QoL) of people with dental phobia compared to the non-phobic population in the United Kingdom using the data from Adult Dental Health Survey (ADHS, 2009).

Method: Secondary analysis of data from the ADHS, 2009. A series of logistic regression analyses was performed with outcome measures of: presence of decayed teeth; presence of missing teeth; Pulp exposure Ulceration Fistula Abscess (PUFA) score; periodontal health indices (plaque, bleeding and loss of attachments); and quality of life (Oral Health Impact Profile [OHIP-14] and Oral Impacts on Daily Performance [OIDP]). Predictors included in the models were: the presence of dental phobia; age; gender; occupational status; oral health related behaviour; dietary intake of sugars and perception of their last visit.

Results: People with dental phobia are more likely to have one or more decayed (caries) teeth/missing teeth. Furthermore, their self-reported oral health related quality of life (OH-QoL) is poorer. There were no differences in PUFA scores or periodontal disease.

Conclusion: The impact of dental phobia on oral health appears to operate largely through the increased likelihood of the presence of caries, since there is an increased likelihood of the presence of teeth with active caries and missing teeth when other predictors of disease experience are controlled in the analysis. ~~The reasons for this are unclear, though may relate either to both patient related factors (delay in seeking treatment, preference for particular treatments) and decision making by dental professionals (seeking to minimise exposure to dental treatment).~~

Introduction

Dental phobia is classified as a specific phobia within the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013) and is characterised as a disproportionate fear in the presence or anticipation of the feared object eliciting a marked anxiety response, of which the individual is aware, and which has a marked impact on the individual's normal life and/or wellbeing. Aside from the social and psychological impact of a dental phobia,¹ there is also an impact on oral health related quality of life (OH-QoL) and oral health.² Within the United Kingdom, an analysis of data from the Adult Health Survey (ADHS) found that individuals with phobic levels of dental anxiety reported lower levels of self-rated oral health, lower levels of general health and were more likely to perceive that they would require dental treatment should they visit a dentist. Furthermore, the authors reported that individuals with dental phobia expressed higher levels of impact of their oral health on quality of life (OHIP and OIDP data). However, in terms of those individuals who were examined clinically, the only significant differences in clinical status were: increased levels of caries, increased PUFA score, increased plaque and bleeding.² This contrasted with previous research suggesting that individuals with dental phobia have higher numbers of missing teeth and decreased numbers of filled teeth.³⁻⁷ ~~However~~⁷ However, Heidari *et al.*² failed to control for socio-demographic differences between the phobic and non-phobic participants, which are likely to have influenced the findings given that the individuals with dental phobia were more likely to be female, younger, have lower levels of education and social status and were more likely to have a long standing illness. These socio-demographic variables are known to be strongly predictive of oral disease.⁸

The aim of this study is to explore the social and demographic correlates of oral health and oral health related quality of life (OH-QoL) of people with dental phobia compared to the non-phobic population in the United Kingdom using the data from Adult Dental Health Survey.⁹ The outcome measures chosen were: presence of decayed teeth; presence of missing teeth; Pulp exposure Ulceration Fistula Abscess (PUFA) score; periodontal health indices (plaque, bleeding and loss of attachments); and quality of life (Oral Health Impact Profile [OHIP-14] and Oral Impacts on Daily Performance [OIDP]). The socio-demographic characteristics, behaviours and attitudes included in the predictive models were: the presence of dental phobia; age; gender;

occupational status; oral health related behaviour; dietary intake of sugars and perception of their last visit.

Materials and Methods

Data source

The complete data set for the Adult Dental Health Survey (2009) was accessed with permission from the UK Data Service (<http://ukdataservice.ac.uk/>).⁹ Full details of the methodology of the survey can be found in O'Sullivan *et al.*¹⁰, while descriptive statistics and a univariate comparison of the phobic and non-phobic participants can be found in Heidari *et al.*²

Outcomes

The following outcome measures were considered for the analysis:

- Caries experience (presence of any decay vs absence of decay)

According to ADHS,¹⁰ decay was classified as: *'teeth with visual caries or cavitated caries or teeth that were so broken down, possibly with pulpal involvement, that they were unrestorable. It includes teeth that had restorations with recurrent caries but does not include teeth that had restorations which were lost, broken or damaged but where there was no recurrent caries'*.

- Number of missing teeth (dichotomised as any missing teeth vs no missing teeth)
- Periodontal health and the Basic Periodontal Examination (BPE) only assessed in participants aged 35 and over
 - Plaque score (presence versus or absence of plaque), n= 2939
 - Bleeding on probing (presence or absence of any bleeding on probing), n= 2931
 - Loss of attachment (measured for participants aged ≥ 55 years, n= 1366 (dichotomised as 0 to 3.4mm vs ≥ 3.5 mm))
- Pulp involvement Ulceration Fistulae Abscess (PUFA) score (scored as 0 or 1 for presence of any element)
- Oral health related quality of life

- Oral Health Impact Profile: OHIP-14 Total score
- Oral Impacts on Daily Performance: OIDP Total score

Predictors

The following potential predictor variables were used in the model to find out the significant predictors of the above outcome measures:

- Dental Anxiety (MDAS, dichotomised as phobic: Total MDAS ≥ 19 or non-phobic: Total MDAS <19)
- Socio-demographic variables:
 - Gender (Male / Female)
 - Age (Classified into bands 16-24; 25-34; 35-44; 45-54; 55-64; 65-74; 75 and over)
 - Social class (classified in groups: managerial and professional occupations; intermediate occupations; small employers & own account worker; lower supervisory & technical occupations; semi-routine and routine occupations; never worked and unemployed).
- Oral health related behaviours:
 - Intake of dietary sugars
 - Frequency of eating cake (6 or more times per week, 3 to 5 times/week, 1-2 times/week, rarely)
 - Frequency of confectionery and sugary drinks (6 or more times per week, 3 to 5 times/week, 1-2 times/week, Rarely)
 - Use of Floss (mentioned vs not mentioned)
 - Use of Interdental brush (mentioned vs not mentioned)
 - Use of Mouthwash (mentioned vs not mentioned)
 - Use of Interspace brush (mentioned vs not mentioned)
 - Use of Electric tooth brush (mentioned vs not mentioned)
 - Use of Sugar-free gum (mentioned vs not mentioned)
- Perceptions of most recent dental visit:

- Dentist listened carefully (vs did not listen)
- There was sufficient time to discuss the problem (vs insufficient time)

Analysis

For the binary outcome measures, Logistic regression models with the above predictor variables were used to find out the significant predictors of the outcome. As the total OHIP, OIDP and PUFA scores did not follow normal distribution, general linear model (GLM) with Gamma family and log link was fitted separately for each of these outcome measures. For the clinical outcome measures (except PUFA score) the predictors listed above were included in the model. For the oral health related quality of life outcomes and the PUFA score, in addition to the predictors outlined above, the clinical indicators of presence/absence of decay, missing teeth and periodontal health were also included in the models. The statistical significance was assessed at 5% level and all the analyses were carried out using SPSS version 22.0 or STATA 12.

Results

The data comprised 10,900 participants of whom a total of 1,367 (12.4%) subjects were identified as phobic (MDAS score ≥ 19). Of these, 344 (25%) were male and 1,023 (75%) female. Other details of the demographic characteristics of phobic and non-phobic participants can be found in Heidari *et al.* ²

Oral health status

Phobic people were more likely to have caries in comparison to non-phobic respondents (Table 1). Other factors that contributed to significant caries levels were if participants were male, brushed their teeth infrequently (never or occasionally) and did not use a range of oral hygiene products (mouthwash, floss, interspace cleaning, sugar free gum and use of electric toothbrush) and felt that the dentist did not listen carefully to them at their last visit.

Table 1 inserted here.

Phobic individuals were more likely to have one or more missing teeth, after correction for other socio-demographic factors. Loss of teeth was also associated with being female, older age groups and lower social classes (Table 2).

Table 2 inserted here.

The presence of dental phobia was not related to periodontal loss of attachment (LoA). The significant predictors of loss of attachment were gender, age and the use of floss – the latter being protective against LoA (see Table 3). Similarly, bleeding on probing was not related to the presence of dental phobia, but was less prevalent amongst those who reported using dental floss (Table 4).

Table 3,4 inserted here.

As shown in Table 5 the presence of plaque was highest amongst those who were: male, aged 55 to 64 or 75 and over, from semi-routine and routine occupations and those who did not mention using floss. The presence of dental phobia was not associated with plaque.

Table 5 inserted here.

There was no significant relationship between the presence of dental phobia and PUFA score (Table 6). However, people who had decayed teeth and plaque had higher PUFA scores as well as those who used mouthwash and felt that the dentist had not listened to them at their most recent visit.

Table 6 inserted here.

Oral Health related Quality of Life (OH-QoL)

There was a significant relationship between dental phobia and OHIP score with individuals with dental phobia reporting higher levels of negative impact on their oral health related quality of life for both OHIP (Table 7) and OIDP (Table 8). The presence of caries was also significant in both models.

Table 7,8 inserted here.

Discussion

This study reports the findings of multivariate analyses comparing individuals defined as phobic of dental treatment or non-phobic on the basis of a questionnaire assessment of Dental Anxiety – the Modified Dental Anxiety Scale (MDAS). The MDAS has good reliability and validity, and the cut-offs for ‘phobic’ respondents at scores of 19 and above is well defined.¹¹ People with dental phobia are more likely to have one or more decayed teeth and missing teeth. Furthermore, their self-reported oral health related quality of life (OH-QoL) is poorer. ~~There was no relationship between phobia and PUFA score or PUFA scores or periodontal disease indices.~~ The persistence of an effect of perceptions of the dentists’ listening when dental phobia is controlled is interesting and worthy of future research.

~~Many~~ people with dental phobia avoid seeing a dentist^{12, 13} on a regular basis to address oral diseases (such as caries and periodontal disease) that are preventable and chronic in nature. Once a visit has been made, the phobic patient might prefer a short term solution of the symptomatic tooth or prefer an extraction.^{14,15} Alternatively differences in the likelihood of having missing teeth may relate to treatment decisions made when the individual with dental phobia finally seeks treatment – with a history of repeated non-attendance practitioners may favour extraction of a tooth rather than booking a number of appointments to complete a complex restoration. ~~Interestingly, there were no relationship between phobia and PUFA.~~ Given that dental phobia is associated with avoidance of dental treatment it could be assumed that

they might present with long standing disease and its consequences presented as PUFA, however fortunately this does not appear to be the case.

Previous research has found that greater dental anxiety is associated with more decayed¹⁶ and missing teeth.^{14,15,17} The findings of this study contrast with previous research which has reported higher levels of periodontal disease in individuals with dental phobia.¹⁸ The reasons for this are unclear but may relate to the clinical observation that individuals with dental phobia report engaging in oral hygiene in an attempt to mitigate the need for dental visits.

Furthermore, phobic participants in a qualitative study reported making a conscious effort to take care of their teeth.¹

Oral diseases are not normally life threatening but can affect people's '*ability to eat, drink, speak and socialize*'.¹⁹ This will have an impact on QoL,^{16,19,20} affecting their physiological, psychological, social and emotional wellbeing.^{14,21,22} People with dental phobia showed higher scores for OHIP and OIDP even when levels of dental disease were controlled for. One possible explanation is that individuals with dental phobia express negative feelings such as sadness, tiredness, discouragement and general anxiety,¹⁶ less vitality and more exhaustion. Embarrassment (a combination of guilt and bad conscience) of their poor teeth will prevent them from smiling and showing their teeth because phobic people rate their oral and general health as poor and frequently perceive that they would require dental treatment upon dental visit.¹⁶ This high perceived need leads to feelings of negative social evaluation, and powerless²³ as well as having a negative effect on their attitude towards dental attendance.²⁴ This potentially has an impact on work situations, personal life and relationships with family members^{1,6,25} which are affected by their negative thoughts and feelings, lack of self-esteem/confidence and sleep.²³

The data presented in this study is extracted from ADHS. The methodology for ADHS has been refined and evolved for each decade using validated questionnaires and calibrated examiners.

Another strength of ADHS is the large random sample who volunteer to have a clinical examination rather than care seeking population attending in a specialised clinic that has traditionally been the case within this field. A limitation of ADHS, is the use of questionnaires which may potentially be subject to problems of recall and retrospective re-interpretation.²⁶ Furthermore the cross-sectional nature of the study does not allow the determination of causal pathways. The use of a questionnaire to define the presence of phobia may not be entirely accurate, though the MDAS has been extensively validated against clinical judgement.

Conclusion:

~~The impact of dental phobia on oral health appear to operate largely through the increased likelihood of the presence of caries, since there is an increased likelihood of the presence of teeth with active caries and missing teeth when other predictors of disease experience are controlled in the analysis. The reasons for this are unclear, though may relate either to both patient related factors (delay in seeking treatment, preference for particular treatments) and decision making by dental professionals (seeking to minimise exposure to dental treatment).~~

Individuals with dental phobia experience an increased likelihood of the presence of teeth with active caries and missing teeth. The findings have implications for the development of preventive services for individuals with dental phobia.

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Table 1: Results of logistic regression of caries status (1 or more teeth with decay) for various predictor variables (n=3766)

Predictors	Comparison group	P value	Odds ratio	95% Confidence interval
Is phobic	The participant is not phobic	0.003	1.42	1.12 to 1.80
Sex	Male	0.004	0.78	0.66 to 0.93
25 to 34	The youngest age group: 16 to 24	0.09	1.33	0.96 to 1.86
35 to 44		0.79	0.96	0.70 to 1.32
45 to 54		0.04	0.70	0.53 to 0.99
55 to 64		0.08	0.74	0.52 to 1.04
65 to 74		0.02	0.65	0.44 to 0.95
75 & over		0.20	1.31	0.86 to 1.98
Intermediate occupations	Managerial and professional occupations	0.97	1.00	0.77 to 1.30
Small employers & own account workers		0.77	0.95	0.70 to 1.30
Lower supervisory & technical occupations		0.57	1.09	0.82 to 1.45
Semi routine and routine occupations		0.06	1.21	0.99 to 1.48
Never worked		0.76	0.94	0.64 to 1.38
Floss has been mentioned	Has not been Mentioned	0.0001	0.64	0.54 to 0.75
Interdental brush has been mentioned	Has not been Mentioned	0.34	0.88	0.70 to 1.13
Mouthwash has been mentioned	Has not been Mentioned	0.034	1.20	1.01 to 1.42
Interspace brush has been mentioned	Has not been Mentioned	0.02	0.71	0.54 to 0.94
Electric tooth brush has been mentioned	Has not been Mentioned	0.03	0.83	0.70 to 0.98
Sugar free gum has been mentioned	Has not been Mentioned	0.04	1.47	1.03 to 2.10
3-5 times/w	Participants have fizzy drinks 6 or more times a week	0.43	0.90	0.69 to 1.17
1-2 times/w		0.37	1.12	0.88 to 1.43
Rarely		0.53	0.94	0.77 to 1.14
Twice a day	Participants clean teeth their teeth more than twice a day	0.32	0.89	0.71 to 1.12
Once a day		0.27	1.16	0.89 to 1.52
Never		0.04	10.04	1.10 to 93.29
Occasionally		0.008	2.18	1.22 to 3.89
Dentist did not listen carefully	Dentist listened carefully	0.02	1.43	1.07 to 1.91

It was not enough time to discuss	It was enough time to discuss	0.95	0.99	0.79 to 1.25
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Table 2: Results of logistic regression of Missing teeth for various predictor variables (n=1372)

Predictors	Comparison group	Effect	P value	95% Confidence Interval
Is phobic	The participant is not phobic	0.05	0.0001	0.02 to 0.08
Sex	Male	0.04	0.0001	0.02 to 0.06
25 to 34	16 to 24	0.007	0.70	-0.30 to 0.08
35 to 44		0.12	0.0001	0.04 to 0.15
45 to 54		0.22	0.0001	0.18 to 0.26
55 to 64		0.35	0.0001	0.33 to 0.39
65 to 74		0.44	0.0001	0.40 to 0.48
75 and over		0.57	0.0001	0.52 to 0.61
Intermediate occupations	Managerial and professional occupations	0.02	0.16	-0.01 to 0.04
Small employers & own account worker		0.04	0.006	0.01 to 0.07
Lower supervisory & technical occupations		0.07	0.0001	0.04 to 0.11
Semi routine and routine occupations		0.07	0.0001	0.05 to 0.09
Never worked and unemployed		0.08	0.0001	0.04 to 0.11
Floss has been mentioned	Has not been mentioned	-0.03	0.001	-0.05 to -0.01
Interdental has been mentioned	Has not been mentioned	-0.02	0.22	-0.04 to 0.01
Mouthwash has been mentioned	Has not been mentioned	0.01	0.25	-0.01 to 0.03
Inter space brush was mentioned	Has not been mentioned	-0.01	0.41	-0.04 to 0.01
Electric brush was mentioned	Has not been mentioned	-0.04	0.0001	-0.06 to -0.02
Sugar free gum was mentioned	Has not been mentioned	-0.02	0.47	-0.06 to 0.03
3 to 5 times/w	Participants eat cakes 6 or more times a week	-0.001	0.91	-0.02 to 0.02
1-2 times/w		-0.01	0.57	-0.03 to 0.02
Rarely		-0.03	0.05	-0.05 to -0.001
3 to 5 times/week	Participants eat sweets 6 or more times/week	0.001	0.95	-0.03 to 0.03
1-2 times/week		-0.008	0.57	-0.03 to 0.02
Rarely		-0.01	0.31	-0.04 to 0.01
3 to 5 times/week	Participants drinks fizzy drinks 6 or more times/week	0.01	0.61	-0.02 to 0.03
1-2 times/w eek		-0.02	0.22	-0.04 to 0.01
Rarely		0.01	0.10	-0.003 to 0.04

Predictors	Comparison group	Effect	P value	95% Confidence Interval
Twice/day	Participants clean their teeth than twice/week	0.01	0.53	-0.02 to 0.03
Once/day		0.03	0.02	0.004 to
Never		0.41	0.0001	0.06
Occasionally		0.08	0.02	0.20 to 0.63 0.02 to 0.15
Dentist did not listen carefully	Dentist listened carefully	0.04	0.03	0.004 to 0.07
It was not enough time to discuss	It was enough time to discuss	-0.01	0.52	-0.03 to 0.02
No decayed teeth	1 or more number of decayed teeth	0.03	0.001	0.01 to 0.05
No plaque	Visible plaque present	-0.004	0.62	-0.02 to 0.01

Table 3: Results of logistic regression of loss of attachment of (3.5 mm or more) for various predictor variables (n=1366).

Predictors	Comparison group	P value	Odds ratio	95% Confidence Interval
Is phobic	The participant is not phobic	0.57	0.88	0.57 to 1.36
Sex	Male	0.001	0.66	0.51 to 0.85
65 to 74	Age group: 55 to 64	0.13	1.22	0.95 to 1.57
75 & over		0.001	1.85	1.28 to 2.67
Intermediate occupations—	Managerial and professional occupations	0.18	0.78	0.55 to 1.12
Small employers & own account workers		0.61	1.10	0.74 to 1.66
		0.04	1.61	1.02 to 2.57
Lower supervisory & technical occupations		0.47	1.12	0.82 to 1.52
Semi routine and routine occupations		0.73	1.11	0.65 to 1.86
Never worked ---				
Floss has been mentioned	Has not been mentioned	0.001	0.65	0.51 to 0.83
Electric brush has been mentioned	Has not been mentioned	0.14	0.84	0.67 to 1.06
Sugar free gum has been mentioned	Has not been mentioned	0.31	0.62	0.25 to 1.55
Twice a day	Participants clean teeth their teeth more than twice a day	0.72	0.94	0.69 to 1.30
Once a day		0.64	0.92	0.62 to 1.35
Never		0.98	0.97	0.10 to 9.71
Occasionally		0.62	0.76	0.26 to 2.21

Table 4: Results of logistic regression of bleeding on probing for various predictor variables (n=2931).

Predictors	Comparison group	P value	Odds ratio	95% Confidence Interval
Is phobic	The participant is not phobic	0.59	1.07	0.83 to 1.40
Sex	Male	0.64	0.96	0.82 to 1.13
45 to 54	Age group is 35 to 44	0.006	1.33	1.10 to 1.64
55 to 64		0.17	1.16	0.94 to 1.43
65 to 74		0.27	0.87	0.70 to 1.11
75 & over		0.68	0.93	0.68 to 1.30
Intermediate occupations	Managerial and professional occupations	0.43	1.10	0.87 to 1.40
Small employers & own account workers		0.58	0.93	0.71 to 1.21
Lower supervisory & technical occupations		0.80	0.96	0.72 to 1.30
Semi routine and routine occupations		0.03	1.25	1.02 to 1.53
Never worked		0.55	1.13	0.75 to 1.71
Floss has been mentioned	Has not been mentioned	0.0001	0.68	0.58 to 0.80
Interdental brush has been mentioned	Has not been mentioned	0.02	0.78	0.64 to 0.97
Mouthwash has been mentioned	Has not been Mentioned	0.02	1.20	1.02 to 1.40
Electric brush has been mentioned	Has not been Mentioned	0.98	0.99	0.81 to 1.22
3 to 5 times/w	Participants eat cakes 6 or more times a week	0.99	0.99	0.81 to 1.22
1-2 times/w		0.64	1.05	0.85 to 1.30
Rarely		0.85	1.02	0.80 to 1.30
3 to 5 times/week	Participants eat sweets 6 or more times/week	0.55	0.71	0.71 to 1.20
1-2 times/week		0.33	0.88	0.69 to 1.13
Rarely		0.62	1.06	0.83 to 1.37
Twice/day	Participants clean their teeth more than twice/week	0.42	0.92	0.74 to 1.13
Once/day		0.94	0.99	0.76 to 1.29
Never		0.24	0.25	0.03 to 2.51
Occasionally		0.003	3.95	1.61 to 9.73
Dentist did not listen carefully	Dentist listened carefully	0.44	1.13	0.83 to 1.54
It was not enough time to discuss	It was enough time to discuss	0.82	1.03	0.82 to 1.30

Table 5: Results of logistic regression of presence of plaque for various predictor variables (n=2939).

Predictors	Comparison group	P value	Odds ratio	95% Confidence Interval
Is phobic	The participant is not phobic	0.19	1.20	0.91 to 1.55
Sex	Male	0.0001	0.65	0.55 to 0.77
45 to 54	The youngest group is 35 to 44	0.33	1.11	0.90 to 1.36
55 to 64		0.003	1.40	1.12 to 1.73
65 to 74		0.44	1.10	0.86 to 1.42
75 & over		0.004	1.67	1.18 to 2.37
Intermediate occupations	Managerial and professional occupations	0.83	1.03	0.81 to 1.30
Small employers & own account workers		0.25	1.17	0.89 to 1.55
Lower supervisory & technical occupations		0.05	1.36	0.99 to 1.86
Semi routine and routine occupations		0.004	1.36	1.11 to 1.68
Never worked		0.073	1.50	0.96 to 2.32
Floss has been mentioned	Has not been mentioned	0.0001	0.73	0.63 to 0.86
Mouthwash has been mentioned	Has not been mentioned	0.01	1.22	1.04 to 1.44
Electric brush has been mentioned	Has not been Mentioned	0.01	0.82	0.70 to 0.96
3 to 5 times/w	Participants eat cakes 6 or more times a week	0.09	1.20	0.97 to 1.49
1-2 times/w		0.12	1.19	0.96 to 1.47
Rarely		0.24	1.16	0.91 to 1.50
3 to 5 times/week	Participants eat sweets 6 or more times/week	0.98	0.99	0.76 to 1.31
1-2 times/week		0.95	0.99	0.77 to 1.28
Rarely		1.21	1.23	0.95 to 1.59
Twice/day	Participants clean their teeth more than twice/week	0.40	0.91	0.73 to 1.13
Once/day		0.94	1.01	0.77 to 1.32
Never		0.99	"_"	"_"
Occasionally		0.10	2.03	0.86 to 4.76
Dentist did not listen carefully	Dentist listened carefully	0.70	1.10	0.77 to 1.47
It was not enough time to discuss	It was enough time to discuss	0.88	0.98	0.77 to 1.24

Table. 6: Results of general Linear Model (GLM) of PUFA scores with various predictor variables (n=3812).

Predictors	Comparison group	Effect	P value	95% Confidence Interval
Is phobic	The participant is not phobic	0.35	0.09	-0.05 – 0.75
Sex	Male	-0.70	0.67	-0.40 to 0.26
25 to 34	16 to 24	0.41	0.24	-0.27 to -0.60
34 to 44		0.14	0.70	1.10 to 0.88
45 to 54		0.25	0.49	-0.47 to 0.98
55 to 64		0.98	0.005	0.30 to 1.67
65 to 74		0.74	0.06	-0.04 to 1.52
75 and over		1.13	0.002	0.40 to 1.86
Intermediate occupations	Managerial and professional occupations	0.30	0.25	-0.20 to 0.80
Small employers & own account workers		0.47	0.10	-0.08 to 1.01
Lower supervisory & technical occupations		-0.02	0.95	-0.55 to 0.51
Semi routine and routine occupations		0.17	0.40	-0.22 to 0.56
Never worked and unemployed		0.80	0.03	0.09 to 1.51
Floss has been mentioned	Has not been mentioned	-0.25	0.15	-0.60 to 0.09
Interdental has been mentioned	Has not been mentioned	0.07	0.75	-0.35 to 0.48
Mouthwash has been mentioned	Has not been mentioned	0.56	0.0001	0.25 to 0.88
Inter space brush was mentioned	Has not been mentioned	-0.35	0.22	-0.91 to 0.21
Electric brush was mentioned	Has not been mentioned	0.01	0.94	-0.29 to 0.31
Sugar free gum was mentioned	Has not been mentioned	-0.45	0.26	-1.23 to 0.33
3 to 5 times/w	Participants eat cakes 6 or more times a week	0.14	0.51	-0.29 to 0.58
1-2 times/w		0.10	0.64	-0.32 to 0.53
Rarely		0.10	0.71	-0.44 to 0.65
3 to 5 times/week	Participants eat sweets 6 or more times/week	0.26	0.32	-0.26 to 0.78
1-2 times/week		0.02	0.93	-0.47 to 0.52
Rarely		0.23	0.36	-0.27 to 0.74
3 to 5 times/week	Participants drinks fizzy drinks 6 or more times/week	0.02	0.92	-0.47 to 0.52
1-2 times/w eek		-0.24	0.37	-0.76 to 0.28
Rarely		-0.11	0.55	-0.49 to 0.26
Twice/day	Participants clean their teeth than twice/week	-0.24	0.31	-0.71 to 0.23
Once/day		0.03	0.92	-0.47 to 0.53
Never		0.55	0.50	-1.10 to 2.20
Occasionally		-0.20	0.66	-1.10 to 0.70
Dentist did not listen carefully	Dentist listened carefully	0.96	0.0001	0.45 to 1.47
It was not enough time to discuss	It was enough time to discuss	-0.26	0.30	-0.74 to 0.23

Predictors	Comparison group	Effect	P value	95% Confidence Interval
No decayed teeth	1 or more number of decayed teeth	1.52	0.0001	1.22 to 1.82
No plaque	Visible plaque present	0.57	0.003	0.18 to 0.94

Table 7: Results of general Linear Model (GLM) of OHIP scores with various predictor variables (n=3807).

Predictors	Comparison group	Effect	P value	95% Confidence Interval
Is phobic	The participant is not phobic	0.45	0.0001	0.30 to 0.61
Sex	Male	0.13	0.03	0.01 to 0.25
25 to 34	The youngest group is 16 to 24	0.25	0.05	0.000 to 0.51
34 to 44		0.31	0.01	0.07 to 0.56
45 to 54		0.40	0.001	0.15 to 0.65
55 to 64		0.40	0.002	0.14 to 0.65
65 to 74		0.25	0.08	-0.03 to 0.53
75 & over		0.01	0.96	-0.32 to 0.34
Intermediate occupations	Managerial and professional occupations	0.22	0.02	0.04 to 0.41
Small employers & own account workers		0.17	0.10	-0.03 to 0.37
Lower supervisory & technical occupations		0.31	0.003	0.11 to 0.52
Semi routine and routine occupations		0.22	0.003	0.76 to 0.36
Never worked and unemployed		-0.01	0.92	-0.31 to 0.28
Floss has been mentioned	Has not been mentioned	-0.90	0.13	-0.21 to 0.03
Interdental has been mentioned	Has not been mentioned	0.22	0.003	0.08 to 0.38
Mouthwash has been mentioned	Has not been mentioned	0.20	0.001	0.08 to 0.31
Inter space brush has been mentioned	Has not been mentioned	0.20	0.02	0.03 to 0.38
Electric brush has been mentioned	Has not been mentioned	-0.26	0.0001	-0.37 to -0.14
Sugar free gum has been mentioned	Has not been mentioned	0.18	0.10	-0.03 to 0.40
3 to 5 times/w	Participants eat cakes 6 or more times a week	0.01	0.89	-0.14 to 0.16
1-2 times/w		0.06	0.47	-0.09 to 0.21
Rarely		-0.03	0.78	-0.22 to 0.16
3 to 5 times/week	Participants eat sweets 6 or more times/week	-0.02	0.85	-0.20 to 0.17
1-2 times/week		-0.25	0.008	-0.43 to -0.06
Rarely		-0.08	0.41	-0.27 to 0.11
3 to 5 times/week	Participants drinks fizzy drinks 6 or more times/week	0.09	0.35	-0.09 to 0.27
1-2 times/w eek		0.02	0.82	-0.16 to 0.20
Rarely		0.009	0.90	-0.13 to 0.14
Twice/day	Participants clean their teeth 6 or more than twice/week	-0.12	0.14	-0.28 to 0.04
Once/day		0.01	0.88	-0.17 to 0.20
Never		0.50	0.28	-0.40 to 1.40
Occasionally		0.25	0.15	-0.09 to 0.58
Dentist did not listen carefully	Dentist listened carefully	0.49	0.0001	0.29 to 0.70
It was not enough time to discuss	It was enough time to discuss	0.05	0.60	-0.12 t 0.22

No decayed teeth	1 or more number of decayed teeth	0.30	0.0001	0.18 to 0.43
No plaque	Visible plaque present	0.005	0.93	-0.11 to 0.12

Table 8: Results of general Linear Model (GLM) of OIDP scores with various predictor variables (n=3812).

Predictors	Comparison group	Coef effect	P value	95% Confidence Interval
Is phobic	The participant is not phobic	0.72	0.0001	0.52 to 0.92
Sex	Male	0.08	0.32	-0.08 to 0.24
25 to 34	16 to 24	0.03	0.87	-0.31 to 0.37
35 to 44		0.08	0.65	-0.25 to 0.41
45 to 54		0.25	0.14	-0.08 to 0.58
55 to 64		0.19	0.28	-0.16 to 0.54
65 to 74		-0.10	0.59	-0.47 to 0.26
75 and over		-0.52	0.02	-0.97 to -0.06
Intermediate occupations	Managerial and professional occupations	0.04	0.71	-0.18 to 0.26
Small employers & own account workers		0.14	0.32	-0.14 to 0.43
Lower supervisory & technical occupations		0.26	0.08	-0.03 to 0.54
Semi routine and routine occupations		0.16	0.10	-0.03 to 0.35
Never worked and unemployed		-0.04	0.87	-0.47 to 0.39
Floss has been mentioned	Has not been mentioned	-0.17	0.03	-0.33 to -0.01
Interdental has been mentioned	Has not been mentioned	0.30	0.005	0.09 to 0.50
Mouthwash has been mentioned	Has not been mentioned	0.30	0.0001	0.12 to 0.42
Inter space brush was mentioned	Has not been mentioned	0.07	0.54	-0.15 to 0.30
Electric brush was mentioned	Has not been mentioned	-0.30	0.0001	-0.44 to -0.14
Sugar free gum was mentioned	Has not been mentioned	0.19	0.24	-0.13 to 0.51
3 to 5 times/w	Participants eat cakes 6 or more times a week	-0.06	0.55	-0.27 to 0.14
1-2 times/w		-0.06	0.58	-0.27 to 0.16
Rarely		-0.14	0.27	-0.40 to 0.11
3 to 5 times/week	Participants eat sweets 6 or more times/week	-0.05	0.70	-0.30 to 0.20
1-2 times/week		-0.40	0.002	-0.61 to -0.14
Rarely		-0.14	0.27	-0.40 to 0.11
3 to 5 times/week	Participants drinks fizzy drinks 6 or more times/week	-0.02	0.90	-0.28 to 0.24
1-2 times/w eek		-0.10	0.40	-0.33 to 0.13
Rarely		0.04	0.71	-0.15 to 0.22

Predictors	Comparison group	Coef effect	P value	95% Confidence Interval
Twice/day	Participants clean their teeth than twice/week	-0.05	0.60	-0.25 to 0.15
Once/day		-0.12	0.32	-0.37 to 0.12
Never		0.28	0.64	-0.90 to 1.46
Occasionally		0.31	0.22	-0.18 to 0.80
Dentist did not listen carefully	Dentist listened carefully	0.65	0.0001	0.38 to 0.91
It was not enough time to discuss	It was enough time to discuss	0.10	0.39	-0.13 to 0.33
No decayed teeth	1 or more number of decayed teeth	0.33	0.0001	0.17 to 0.50
No plaque	Visible plaque present	-0.03	0.70	-0.19 to 0.13